LIVERMORE LAB
REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, Dec. 19-23, 2011.

BuffaloNews.com THE MOON BY ANY OTHER AGE

The man in the moon may have fewer gray hairs than widely believed.

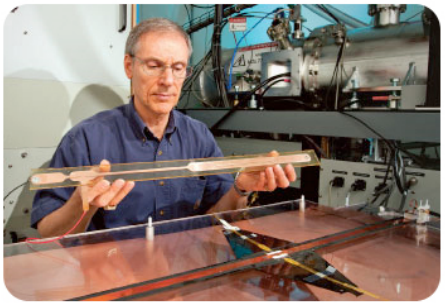
The moon may be 200 million years younger than original estimates, according to a Lab researcher who analyzed a rock brought back to Earth by Apollo 16 astronauts in 1972.

The research could send lunar scientists back to the drawing board to reconsider the moon's evolution. The moon's original estimate was 4.5 billion years ago.

But LLNL geochemist Lars Borg's three calculations revealed very different ages from those original estimates -- an average of about 4.36 billion years, which surprised the scientists. "We all looked at one another and laughed," Borg said.

To read more, go to *Buffalo News*.

INTERNATIONAL BUSINESS TIMES THE PROS OF TREATING CANCER



Lab physicist George Caporaso examines Compact Particle Acceleration Corporation's newest design.

Cancer treatments combine toxic drugs with X-ray radiation to poison and kill rogue cells and tumors.

But proton beams can be a more powerful and accurate radiation source to blast away cancer. The Laboratory has developed a proton therapy accelerator, which was born out of the Laboratory's nuclear weapons program, and may begin to appear in hospitals to deliver lifesaving therapy.

The path to this success has been long and challenging, but the payoff for patients is enormous. Unfortunately, the next-generation therapy has remained out of reach to most doctors because of the cost.

With growing investor interest, the technology is starting to take hold and will soon be on track to become the status quo for treating cancer with radiation, experts say.

To read more, go to the *International Business Times*.

ClimateWire ENERGIZING FUNDS

The Lab and the California Energy Commission are working on ways to increase the amounts of wind and solar generation integrated into California's energy grid.

The Lab recently received $1.75 million from the CEC to power up the energy grid.

The project will use LLNL's high-resolution weather models and high performance computing to characterize intermittent renewable resources, including wind and solar power.

California has mandated that 33 percent of energy generated in the state must come from renewables by 2020. As more renewable energy resources are added to the grid, the ability to accommodate them becomes more challenging.

To read more, go to *Climate Wire*.

SPIE EYE ON ADAPTIVE TECHNOLOGY

The Lick Observatory on Mt. Hamilton

Astronomers are getting a clearer view of extrasolar planets thanks to adaptive optics (AO).

Livermore plays a large role in using AO on telescopes around the world to get a more precise vision of stars, galaxies and even planets outside our solar system. Whenever light from stars passes through the atmosphere, it becomes distorted by layers of air with different temperatures and densities. As a result, we see a shimmering or twinkling orb instead of the distinct and steady pinpoint of light seen from space.

But AO corrects the wavefronts of light, "straightening" them so that stars, galaxies and other celestial objects gain resolution and contrast. Brought to life in the 1950s by astronomers, AO was developed in the 1970s for laser beam propagation as part of the U.S. Strategic Defense Initiative.

To read more, go to *SPIE*.

LIVERMORE LAB REPORT TAKES A BREAK

In observance of the Christmas and New Year's holidays, the *Livermore Lab Report* will take a break. It will return Jan. 6.

LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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